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ABSTRACT

Self-perception measures often suffer from inflation factors. This study compared a Likert-type scale measuring comfort (1="not at all comfortable" to 5="very comfortable") to one assessing knowledge (1="I do not know anything about this", 2="I don't know enough about this to fully understand it", 3="I'm not sure whether or not I know enough about this", 4="I know enough about this, however, I want to know more about it", 5="I know a lot about this") related to specialized medical assessment and management skills. Participants were 111 registered emergency medical technicians. The knowledge scale was found to be less inflated than the comfort scale. Since the scales contained identical item stems, the different in scores could indicate a response bias or social desirability effect on the comfort scale. When asking evaluation questions based on the perception preparedness before and after an educational program, using a knowledge scale may provide results that are more useful to program evaluators. (Author/SLD)

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Self-perceptions of knowledge and comfort: Which measure is more sensitive? [1]

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Abstract:
Self-perception measures often suffer from inflation factors. This study compared a Likert-type scale measuring comfort (1="not at all comfortable" to 5="very comfortable") to one assessing knowledge (1="I do not know anything about this," 2="I don't know enough about this to fully understand it," 3="I'm not sure whether or not I know enough about this," 4="I know enough about this, however I want to know more about it" and 5="I know a lot about this") related to specialized medical assessment and management skills. The knowledge scale was found to be less inflated than the comfort scale.
Since the scales contained identical stem items, the difference in scores could indicate a response bias or social desirability effect on the comfort scale. When asking evaluation questions based on the perception of preparedness before and after an educational program, using a knowledge scale may provide results that are more useful to program evaluators.

[1] Presented at Evaluation '99, the Annual Meeting of the American Evaluation Association, November 1999, Orlando, Florida.

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Study Background:

In emergency medical services (EMS), calls involving children often are the most stressful for prehospital providers. When skills are not used frequently, as with many advanced pediatric skills, skills deterioration and an increase in provider anxiety become more likely (Kumar, Bachman, et al., 1997). Some authors suggest that the anxiety inherent in a response to a pediatric emergency prompts what is referred to as a "scoop and run" approach as fewer procedures are performed in an attempt to transport the child to definitive care as quickly as possible (Ibid.). The solution to the problem: provide more educational opportunities for EMS personnel to practice infrequently-used pediatric skills so that patients do not suffer as a result of the provider's anxiety (Gausche, 1997; Losek, Szewczuga, et al., 1994). However, determining which skills should be given increased attention in continuing education (CE) programs for prehospital personnel can be difficult.

This paper discusses some of the challenges inherent in surveying a group about their self-perceptions of preparedness using the constructs of comfort and knowledge. We investigated whether the wording on a survey instrument would influence the responses received from the survey recipients—prehospital emergency personnel.

Methods:

The study sample consisted of 111 nationally registered EMT-Paramedics from an urban area in the southwest. All paramedics received the survey prior to completion of a self-study program about the emergency medical care of children with special health care needs. Since these children often require technological adjuncts or a specialized approach to assessment and management, we were interested in the paramedics' preparedness when encountering such children in emergency situations.

We developed comfort and knowledge scales to assess the paramedics' self-perceived competence and knowledge. The items represented a range of skill difficulty and covered the specialized management skills to be covered in the self-study CE program. The comfort and knowledge scales included the following areas of emphasis: management of complications with tracheostomies, with gastrostomies and with indwelling central venous catheters and recognition of complications associated with cerebrospinal fluid shunts, with latex allergies and with child abuse.

The five-point Likert-type comfort scale ranged from low to high as follows: 1="not at all comfortable," 2="not very comfortable," 3="not sure," 4="somewhat

comfortable" and 5="very comfortable." The five-point Likert-type knowledge scale ranged from low to high as follows [3]: 1="I do not know anything about this," 2="I don't know enough about this to fully understand it," 3="I'm not sure whether or not I know enough about this," 4="I know enough about this, however I want to know more about it" and 5="I know a lot about this." A mean comfort or knowledge score was calculated for those cases in which at least nine of the ten items on a scale were complete.

The data were analyzed using Statistical Package for Social Sciences (SPSS), Release 8.0 for Windows. The comparison between the different scales (comfort and knowledge) used paired-samples t-tests to compare the average scores. Unless otherwise specified, an alpha level of .05 was deemed significant.

Results:

Both of the scales had high Chronbach's alphas: alpha=.850 (n=107) for the comfort scale and alpha=.855 (n=111) for the knowledge scale. The average scale scores, as well as item averages, can be found in Table 1.

The mean comfort score ($\underline{M}$=2.97) was significantly higher than the mean knowledge score ($\underline{M}$=2.67), $\underline{t}(110)=6.90$, $\underline{p}<.01$. Additionally, all but one of the items had significantly higher comfort scores than knowledge scores. Table 1 contains details from the paired samples t-tests for each item.

[3] This scale originally was conceptualized by Drs. Cliff Scherer and Paul Yarbrough for a state-wide survey of attitudes of farmers in New York state about technology. It later was modified for use in a study of student attitudes about risks: *Reaching Cornell Students with Risk Information: A Study of Perceptions and Behaviors Related to Slope Day 1996* with Drs. Alicia Marshall and Cliff Scherer. All professors were affiliated with Cornell University at the time of the research.

Discussion:

While the two scales do not assess exactly the same concepts, both provide information about self-perceptions related to preparedness. Since the two scales contained identical stem items, the difference in scores could indicate a response bias or social desirability effect on the comfort scale, especially since the items assessed preparedness to respond to infrequent pediatric medical emergencies about which the paramedics typically receive little or no detailed training. Given the comfort scores were consistently higher than the knowledge scores, the knowledge scale appears to elicit responses that are less inflated than the comfort scale. When asking evaluation questions based on the perception of preparedness before and after an educational program, using a knowledge scale may provide results that are more useful to program evaluators.

However, it is possible that the concepts of knowledge and comfort are disparate enough to merit inclusion of two such scales when assessing preparedness. For example, paramedics may equate comfort with their ability to extrapolate emergency medical management information from skills they use with adult patients to unfamiliar settings involving pediatric patients. However, it is likely that knowledge about such specialized pediatric skills may be similarly related to knowledge of procedures commonly used with adults, so this is not a factor likely to explain the variation in responses.

Another possible interpretation of the results pertains to the wording of the choices. The choices on the knowledge scale were much richer and more detailed than those on the comfort scale. This may have allowed the respondents to make more informed choices to answer the questions. It is possible that given more detailed scale choices, more informative data about comfort levels may be gathered. For example, in their study of emergency physicians and pediatric emergency medical procedures, Simon and Sullivan (1996) used a comfort scale with the following scale points: 1="comfortable", 2="moderately comfortable", 3="uncomfortable but would perform in an emergency", and 4="uncomfortable and would never perform". Using more detailed scales—comfort, knowledge or both—may be one way to improve the data and possible conclusions that may be drawn from program evaluation measures.

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Table 1. Average comfort and knowledge scores.

Management Skills	Comfort [a]	Knowledge [b]	t
Replacing an infant's tracheostomy tube	2.44	2.44	0.00
Performing CPR on a child with a tracheostomy	4.00	3.69	4.46 **
Suctioning a child's tracheostomy tube to clear an obstruction	3.79	3.45	4.84 **
Using a child's gastrostomy button to relieve abdominal distention during CPR	2.28	1.77	5.77 **
Managing a child's dislodged gastrostomy tube	2.20	1.81	5.03 **
Using a partially implanted indwelling central venous catheter to administer a fluid bolus	2.85	2.40	5.22 **
Using a totally implanted indwelling central venous catheter to administer medication	2.95	2.37	7.26 **
Recognizing signs of ventriculoperitoneal (VP) shunt occlusion in a pediatric patient	1.89	1.69	2.52 *
Recognizing signs of an allergic reaction to latex	3.31	3.13	2.17 *
Recognizing signs of child abuse and neglect	4.05	3.91	2.31 *
Total	2.97	2.67	6.90 **

[a] 1=not at all comfortable; 2=not very comfortable; 3=not sure; 4=somewhat comfortable; 5=very comfortable

[b] 1=I do not know anything about this; 2=I don't know enough about this to fully understand it; 3=I'm not sure whether or not I know enough about this; 4=I know enough about this, however I want to more about it; 5=I know a lot about this

* $p < .05$

** $p < .01$

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